

Senators, and his reports and speeches reveal a man of frankly liberal views and of firm and stable character. He was, for a short time, Minister of Public Instruction in one of the ministries of the Marchese di Rudini.

The fame of Luigi Cremona is world-wide. Almost all the foreign academies elected him a fellow. His death (which happened on June 10 last) has been a loss not only for Italy, but for science universal, in which his discoveries will long secure him a place of honour.

In the course of a note appended to Prof. Blaserna's valuable statement of facts as to Cremona's career, Prof. Chrystal remarks:—

In the year 1884, Cremona, along with Hermite and his son-in-law Emile Picard, was my guest during the tercentenary festival of the University of Edinburgh. Besides these three distinguished mathematicians, the following were present at the festival:—Helmholtz, Bierens de Haan, Cayley, Sylvester, Lord Kelvin, Stokes, Salmon, Lord Rayleigh, and Tait. The majority of these dined one evening with Lord M'Laren, and it is scarcely probable that there ever was such a feast of mathematicians before or since. Of this brilliant band of nineteenth century men of science, there remain with us now only Kelvin, Rayleigh, and Picard.

#### NOTES.

THE ninth International Geological Congress was opened at Vienna on Thursday last, when Dr. Tietze, director of the Imperial Institute of Geology, was elected president.

A REUTER telegram from Cape Town states that the Cape Legislative Council has agreed to a motion in favour of addressing a communication to the Imperial Government on the subject of the adoption of the metric system.

ACCORDING to the *Athenaeum*, a resolution was passed at the conclusion of the recent geodetic congress at Amsterdam requesting the various nations to carry out extensive measurements of gravity from the Atlantic towards the east through the lowlands of Europe and Asia, as well as in the plateau around Thibet. A clear conception of the variations of weight and of the distribution of bulk in the crust of the earth would be gained thereby in connection with astronomical determinations of longitude and latitude.

*Science* states that the commission sent by the U.S. Marine Hospital Service to Vera Cruz reports three propositions as having been demonstrated beyond doubt, namely, (1) that the cause of yellow fever is an animal parasite, and not a vegetable germ or bacterium; (2) that the disease is communicated only by the bite of mosquitoes; (3) that only one genus of mosquitoes, *Stegomyia Fasciata*, is the host of the yellow fever parasite.

THE *British Medical Journal* states that Dr. S. R. Christophers, who was associated with Dr. Stephens in the investigation as to malaria conducted on the west coast of Africa and in the Indian cantonments, has been notified by the Indian Government that the medical authorities desire him to proceed at once to India, with the view of his again taking up special work relating to malarial infection. Dr. Christophers is, it is stated, leaving almost immediately to enter upon his duties.

ACCORDING to a Stockholm correspondent of the *Times*, the Swedish steamer *Frithjof*, which on August 17 started from Stockholm for the relief of Dr. Otto Nordenskjöld's South Polar Expedition, will take on board at Bremerhaven provisions for three years and wireless telegraphy apparatus.

Such apparatus is also, it is stated, to be fitted on board the Argentine gunboat *Uruguay*, and it is thought that this vessel, which is iron built, will remain outside the ice while the *Frithjof* will push on as far south as possible. From Bremerhaven the *Frithjof* will go to Plymouth to coal, and then *via* Madeira to Buenos Ayres, where possibly an Argentine naval officer will join her. She will then go to Punta Arenas, whence her commander proposes to reach Snowhill, the supposed winter station of the Antarctic.

ON Saturday last the Canadian Government steamer *Neptune* sailed from Halifax, Nova Scotia, for Hudson Bay and Arctic waters on an expedition to last a year and a half. The object of the expedition is to conduct, on behalf of the Government, a botanical, geological, and natural history investigation. The party will take formal possession of the Arctic Islands and the shore of Baffin's Bay. The commander of the expedition will report on the alleged extensive American poaching in the Hudson Bay fisheries. The importance of the cod and halibut fisheries will be reported on.

A MESSAGE from Naples, dated August 22, states that the explosions of Mount Vesuvius are increasing in violence, and quantities of volcanic matter have been thrown to a height of about 200 yards. At half past 6 o'clock of the morning referred to, a slight earthquake shock was felt.

THE arrangements for the eighth International Geographical Congress, to be held next year at Washington, are, says the *Times*, taking shape under the care of a committee representing the ten geographical societies and mountaineering clubs of the United States, which have united to welcome the geographers of all nations to American soil. The congress will meet in Washington on September 8, 1904, and will hold daily sessions on September 9, 10, 12, 13, and 14. The subjects for treatment and discussion during the meeting at Washington are classified under the following heads:—(1) Physical geography, including geomorphology, meteorology, hydrology, &c.; (2) mathematical geography, including geodesy and geophysics; (3) biogeography, including botany and zoology in their geographical aspects; (4) anthropogeography, including ethnology; (5) descriptive geography, including explorations and surveys; (6) geographical technology, including cartography, bibliography, orthography of place-names, &c.; (7) commercial and industrial geography; (8) history of geography; (9) geographical education. The committee urges that early notice be given by those desirous of presenting communications or proposing subjects for discussion, July 1, 1904, being fixed as the latest date for submitting communications designed for printing in connection with the congress, and August 1 in the case of abstracts (not exceeding 1000 words in length) designed for insertion in the daily bulletin.

AN International Electrical Congress will be held at St. Louis, Mo., from September 12 to 17 of next year. The sections which have been proposed for the main body of the congress are:—*General Theory*.—Section A, mathematical and experimental. *Applications*.—Section B, general applications; Section C, electrochemistry; Section D, electric power transmission; Section E, electric light and distribution; Section F, electric transportation; Section G, electric communication; Section H, electrotherapeutics. Prof. Elihu Thomson has been elected president of the committee of organisation, and the general secretary is Dr. A. E. Kennelly, Harvard University, Cambridge, Mass.

THE *Times* Brussels correspondent states that the eleventh International Health Conference will be held in Brussels from September 2 to 8. One of the leading questions for discussion is whether the tuberculosis bacillus in the domestic animal is identical with that of the human species.

IN connection with an exhibition which is to take place at Milan in 1905, a national sanitary congress is to be held. The work of the congress will be dealt with in the following sections:—sanitary assistance, public hygiene, clinico-scientific and therapeutic, medical jurisprudence and accidents to workmen, professional interests.

A GENERAL exhibition arranged by the Central Association of Inventors, of Bayreuth, for the purpose of facilitating the sale of patents and copyrighted patterns is to be held during September and October next at Nuremberg. There are, it is stated, more than 200,000 copyrighted patterns in Germany and more than 140,000 patents, but one-half of these are not in public use, the reason being that the inventors are not able to exploit their inventions. It was because of this that the Central Association came into being some years ago. Its purpose is to assist the members to make their inventions profitable to themselves, the majority of inventors not having the means to do so. The Association furnishes space to inventors without means free of cost, and charges no fees for effecting a sale.

ACCORDING to a Reuter telegram from Berlin, a number of mining officials will, at the instance of the Minister of Commerce, shortly be sent to this country to make a thorough study of the hygienic and sanitary arrangements in mining districts.

THE *Electrician*, quoting from the *Western Electrician* of Chicago, states that preliminary reports have been given concerning wireless telegraph experiments which have been conducted on board the training ships *Prairie* and *Topeka*, in conjunction with shore stations, by the Navy Department of the United States during the last year. The reports state that the Slaby-Arco system is well suited for naval purposes, and has been adopted by the United States Navy. It was tested in competition with French, German, and English devices, not, however, including the Marconi system. Satisfactory terms, it is stated, could not be made with Mr. Marconi for the installation of his instruments on the war ships, and further negotiations were discontinued. Twenty sets of Slaby-Arco instruments have been installed on eight war vessels, which used them in the fleet manoeuvres.

A TELEGRAM from New York, through Laffan's agency, states that the advisory board of the American scientific expedition to Babylon has been compelled to abandon its plan of extensive excavations at that place, preparations for which have been made during the last three years. The abandonment is due to the persistent refusal of the Porte to permit the American society to carry on such work, although it has readily authorised excavations by other nations.

THE collections made by Mr. M. J. Nicoll, who accompanied Lord Crawford, as naturalist, in the *R.S.Y. Walhalla* during his recent tour round the world, have arrived at the Natural History Museum, South Kensington, and contain about 1500 specimens. The *Walhalla* remained so short a time at most of the places where she stopped that it was not possible to procure a large number of examples of terrestrial animals, but about 250 bird-skins were brought home. The principal collections were made in the

Magellan Straits, at Valparaiso, in the Samoan and Fiji groups of the Pacific, and in Torres Straits. Mr. Nicoll is now engaged in arranging and naming the specimens.

SEVERAL living specimens (three of which have arrived safely) of the wild guinea-pig of Brazil have, according to *Science*, recently been sent to the zoological laboratory of Harvard University by Mr. Adolph Hempel for the purpose of experimental studies in heredity.

DR. CARROLL gives an interesting *résumé* of our knowledge of the mode of transmission of yellow fever (*Journ. Amer. Med. Assoc.*, May 23). He points out that the mosquito theory has been proved to be true, and that the non-communicability of the disease from person to person, and by means of fomites, has been demonstrated. Yellow fever has been eradicated from Havana, one of its endemic homes, by the institution of measures directed against the mosquito, after extreme cleanliness and energetic disinfection had proved dismal failures.

THE specificity of anti-venene, the anti-serum for snake venom, has been a matter of controversy for some years. Calmette originally asserted that anti-venene was not specific, that is, cobra anti-venene, prepared by injecting an animal with increasing doses of cobra venom, though most active against cobra venom, would also antagonise other venoms. Martin, and more recently Tidswell, in Australia, questioned the correctness of this view, and Captain Lamb, I.M.S., has now proved beyond doubt that anti-venomous sera are just as specific as any other antisera, e.g. diphtheria or tetanus (*Sc. Mem. of the Gov. of India New Series*, No. 5). He has tested the neutralising properties of several anti-venomous sera towards the venoms of many species of venomous snakes, and in no case was any neutralising power exhibited by a serum except towards the venom with which it had been prepared.

THE annual report issued by the superintendent of the Botanical Department in Trinidad bears testimony to the useful work which is carried on at the St. Clair experiment station. The Lagos "silk rubber" plant *Funtumia elastica* continues to be in demand, as the points in its favour are suitability to the climate, easy coagulation, and good rubber yield at an early age. The experiments with seedling sugar-canes are unfortunately limited by the small amount of space available for growing plots, but the demand for canes to the full extent of the available supply is a sufficient guarantee of the success of the undertaking. The cultivation of cotton in the West Indies would be the revival of an old industry. Through the cooperation of the Cotton Growers' Association, a quantity of seed has been provided for distribution, and prizes are offered for the best results.

THE botanical features of that district comprised in the Delta of the Ganges known as the Sundribuns are so unique that even after the surveys by Prof. Heinig and Mr. C. B. Clarke there still remains scope for the account which is presented by Dr. Prain in the *Records* of the Botanical Survey of India. This includes the first complete list of plants gathered in the district, with a guide to the genera and species, as well as a summary of the principal ecological associations, and observations on the manner in which they may have originated. First in point of interest comes the mangrove vegetation, which includes a heterogeneous collection of plants, many of which are characterised by the development of root suckers having a respiratory function; further, the collections of plants found at the sea face and in the clearings present problems in connection with the dispersal of species.



THE causes of acceleration and retardation in the metamorphosis of *Amblystoma tigrinum*, the adult form of the Mexican axolotl, form the subject of an article by Mr. J. H. Powers in the June number of the *American Naturalist*. According to the author, previous observers have been in error in attributing the retention of the larval form to inability to leave an aquatic life, and, conversely, the early acquisition of the adult condition to removal from water. The real factor in the case, he believes, is nutrition. A paper by Mr. J. H. Lovell, in the same journal, on the colours of northern gamopetalous flowers and their relations to bees and other insects, contains much matter of interest alike to the botanist and to the entomologist. The sequel will be published in a later number.

To vol. ii. No. 5 of *Marine Investigations in South Africa*, Dr. J. D. F. Gilchrist contributes some important notes on the development of South African fishes. The publication of these notes, which are confessedly crude and imperfect, would have been deferred until fuller investigations had been undertaken were it not for the circumstance that they have an important bearing on certain disputed points connected with the Cape fisheries. Many of the fishermen urge, for instance, that the spawn of several of the commoner food-fishes is developed on or near the sea-bottom, and is, in consequence, seriously damaged by trawling. To this the author replies that, since in northern waters it has been demonstrated that only one valuable food-fish, the herring, has deep-lying spawn, and since the Cape seas are the home of only a small species of herring of little or no commercial value, it is probable that the damage done by trawling in South African waters has been largely overestimated.

A PRELIMINARY report upon "Trypanosomiasis of Horses ('Surra') in the Philippine Islands," by Messrs. Musgrave and Williamson, has been issued by the Government Laboratory, Manila. The disease seems to have been recently introduced into the Philippines, for careful investigation has failed to show any evidence that it existed there before May or June, 1901. It is transmitted through the bites of insects, and until the exact species are discriminated, for preventive measures all insects should be considered as carriers of the infection. In Manila a certain number of the rats have been found to be infected with the horse trypanosoma. An account is given of the symptoms of the disease and of the preventive measures to be adopted, the most important of which is the prevention of the access of all flies and insects.

A SHORT time ago M. Blondlot announced the discovery of a new form of radiation found with Röntgen rays, and possessing the power of penetrating black paper and many metals. The rays could be reflected and refracted by quartz lenses, and were without photographic action; they could, however, be detected by their power of increasing the luminosity of small electric sparks or of a colourless "blue" flame. The rays were subsequently shown by M. Blondlot to be produced by an Auer burner. Following up his researches on these  $n$  rays, M. Blondlot has been led to discover some remarkable properties which they possess; these are communicated in a recent number of the *Comptes rendus*. It seems that the rays are capable of increasing the illumination given by an incandescent surface on which they fall, and this without any increase of temperature. An experiment which seems conclusive is quoted; a platinum wire which was heated to a dull red was subjected to the action of the rays, and whenever these were allowed

to fall on it the incandescence was visibly increased. An auxiliary electrical circuit afforded a means of measuring the resistance, and hence the temperature of the wire, and this showed that the rays produced no increase in temperature; an increase of temperature too small to produce a visible effect in the incandescence of the wire was easily detected by the measuring circuit. This result is particularly interesting, not only in reference to the  $n$  rays of M. Blondlot, but in reference to theories of incandescence and light emission generally, as it seems possible that these rays may be able to throw some light on the many difficult problems that beset this subject. The remarkable properties that this radiation seems to possess promise to make it of unusual interest, and possibly also of great utility.

IN the *Gazette de Lausanne*, M. F. A. Forel directs attention to what appears to be a recurrence of the coloured circle round the sun (Bishop's Ring), similar to that which was observed after the Krakatoa explosion in 1883. The present phenomenon is paler than that first described by Mr. Bishop, and is supposed to be connected with the eruption of Mont Pelée in May, 1902. M. Forel states that it can only be seen at an altitude of not less than 2000 metres; it was first seen by him on August 1, and he points out that it would be very interesting if alpine climbers, or balloonists, would state when the ring was first observed by them, and whether its appearance is intermittent or continuous.

A CORRESPONDENT of the *Times* directs attention to a supposed cure for the mysterious malady known as mountain sickness. The discoverer of the specific is a Russian topographer named Passtoukhof, who, for some years past, has been making ascents in the Caucasus, where he has climbed the Grand Ararat, Mount Kasbek, and Mount Elbruz. At such high altitudes as these it is easy to understand that the question of mountain sickness becomes a serious one, and on more than one occasion M. Passtoukhof has found not only himself, but all the other members of his expedition, completely prostrated by it. On one of these occasions it occurred to him to try the experiment of lighting his spirit lamp and making some tea, which he administered to himself and his companions in an almost boiling condition, with a result that far exceeded his expectations. Almost immediately the more serious symptoms disappeared, and in a short time all the members of the expedition found themselves well enough to continue the ascent. Later on M. Passtoukhof repeated this experiment of using boiling tea as a remedy for mountain sickness, with results so invariably successful that he now feels justified in considering that it may really be regarded as a specific.

A CORRESPONDENT directs our attention to the fact that one feature of the programme at present in force at the Alhambra is an exhibition of the microbroscope. We are glad, like our correspondent, that science is being introduced—even in the form of amusement—to those who, in ordinary circumstances, take no interest in scientific matters, and think with him that more might be done even with existing resources to bring a knowledge of the advances of science under the notice of the people. "The music halls are," says our correspondent, "being increasingly used for good music; why not for good science? The managers will put money into it if the public respond, and no objection will be made to raising the tone of their programmes if the houses fill. Those interested in science need not spend the evening there; they could go to see just what concerned them."

THE Engineering Standards Committee has just issued "standard sections and specification" for tramway rails. If the series of rails be adopted, it should be easier for the British manufacturer to hold his own against foreign competition, which, in the case of tramway rails, is particularly severe.

We have received the first parts of the monthly *Bulletin* of the Philippine Weather Bureau for 1903, prepared under the direction of the Rev. José Algué, S.J., director of the service. This bulletin, modelled on the plan of the United States meteorological publications, contains valuable climatological observations and general notes on the weather and crops. The report for 1902 contains an interesting account of the establishment and development of the service under the Spanish Government, and of its reorganisation and improvement under the United States. Meteorological observations were begun in Manila in 1865, and after many years of assiduous study of the behaviour of the typhoons of the eastern seas, Father Faura, the first director of the observatory, commenced his predictions of the approach of typhoons in July, 1879. These storm warnings have been the means of saving much life and property, not only in the Philippine Islands, but on the Chinese coasts. Their value is now fully recognised by the United States Government and by the Colonial Secretary and Chamber of Commerce of Hong Kong. On the recommendation of the chief of the U.S. Weather Bureau, a network of subsidiary stations has been established in the archipelago which will doubtless render invaluable service to our knowledge of the meteorology of the Far East.

A PAMPHLET of sixty-nine pages, extracted from the report of the expedition of the *Stella Polare* in 1899-1900, deals with the magnetic observations undertaken in the Bay of Teplitz by Captain Umberto Cagni. These observations were reduced by Prof. Luigi Palazzo, who gives the following results for July, 1899, and June, 1900:—Declination,  $21^{\circ} 10'$  and  $21^{\circ} 18'$  east; inclination,  $83^{\circ} 25'$  and  $83^{\circ} 12'$  north; horizontal intensity, 0.06846 and 0.06855; vertical intensity, 0.59319, 0.55990; total force, 0.59713, 0.56409. The principal instruments used were a unifilar Schneider magnetometer and a Kew inclinometer, but great difficulties were experienced in making the observations; among other inconveniences, snow was carried into the temporary observatory, and succeeded in penetrating through every crack or crevice.

SOME recent researches in the comparatively modern study of experimental phonetics are given by Prof. E. W. Scripture (Yale) in the *Medical Record* (February 28), and *Die neuern Sprachen* (January). In the former paper, Prof. Scripture describes the different methods that have been employed for registering the sound curves of the human voice. The method preferred by the author is to obtain a gramophone or phonograph record of the voice and to trace off an enlargement of the fluctuations either by mechanical or by photographic methods. In the second paper, Prof. Scripture describes a complete record of the melody of the Lord's Prayer as recited in the style characteristic of the eastern part of the United States. A diagram is given showing the main variations of pitch. An investigation in another branch of physiological acoustics, dealing with the audibility of vowel sounds under pathological conditions, is given by M. Marage in the *Comptes rendus* (February).

THE additions to the Zoological Society's Gardens during the past week include two White-crowned Mangabays

(*Cercocebus oethiops*) from West Africa, presented by Mr. C. R. Farquharson; an Ocelot (*Felis pardalis*) from Rio de Janeiro, presented by Mr. John Gordon; a Grand Eclectus (*Eclectus roratus*) from Moluccas, a Black-crested Cardinal (*Gubernatrix cristatella*) from Paraguay, a Red-headed Cardinal (*Paroaria larvata*), a White-throated Finch (*Spermophila lineola*) from Brazil, presented by the Right Hon. Earl of Crawford, K.T.; a Brown-throated Conure (*Conurus oeruginosus*) from South America presented by Mrs. M. Moir-Byres; a Barred Dove (*Geopelia striata*) from India, a West African Love-bird (*Agapornis pullaria*) from West Africa, presented by Sir Arthur Bigge, K.C.B.; a Common Snake (*Tropidonotus natrix*), British, presented by Mr. Oliver Roberts; a Yellow Baboon (*Papio cynocephalus*) from Africa, a Lesser White-nosed Monkey (*Cercopithecus petaurista*) from West Africa, a Lion Marmoset (*Midas rosalia*) from South-east Brazil, an Echidna (*Echidna hystrix*) from New South Wales, two Stanley Parrakeets (*Platycercus icterotis*), two Tree Sparrows (*Passer montanus*), three Limbless Lizards (*Pygopus lepidopus*), a Muricated Lizard (*Amphibolurus muricatus*), a Cunningham's Skink (*Egernia cunninghami*) from Australia, a Lesser White-fronted Goose (*Anser erythropus*), two Jackdaws (*Corvus monedula*, var.), European; an American Glass Snake (*Ophirosaurus ventralis*), a Hog-nosed Snake (*Heterodon platyrhinos*), two Couch's Snakes (*Tropidonotus ordinatus couchi*) from North America, deposited; nine Summer Ducks (*Aex sponsa*) from North America, purchased.

#### OUR ASTRONOMICAL COLUMN.

##### ASTRONOMICAL OCCURRENCES IN SEPTEMBER:—

- Sept. 3. 8h. Saturn in conjunction with moon. Saturn  $5^{\circ} 26' S$ .  
 5. 9h. 26m. Minimum of Algol ( $\beta$  Persei).  
 7. 5h. Mercury at greatest eastern elongation ( $27^{\circ} 0'$ ).  
 11. 18h. Jupiter in opposition to the sun.  
 12. Saturn. Polar diameter =  $16''.3$ , outer minor axis of outer ring =  $14''.39$ .  
 15. Venus. Illuminated portion of disc = 0.002; of Mars = 0.891.  
 17. 9h. Venus in inferior conjunction with the sun.  
 „ 13h. 53m. to 14h. 36m. Moon occults  $\alpha$  Cancri (mag. 4.3).  
 20. Sun totally eclipsed, invisible at Greenwich.  
 21. 7h. 13m. to 10h. 22m. Transit of Jupiter's Sat. III. (Ganymede).  
 23. 18h. Sun enters Libra. Autumn commences.  
 25. 11h. 9m. Minimum of Algol ( $\beta$  Persei).  
 27. 7h. 55m. to 11h. 2m. Transit of Jupiter's Sat. IV. (Callisto).  
 28. 7h. 58m. Minimum of Algol ( $\beta$  Persei).  
 „ 10h. 30m. to 13h. 40m. Transit of Jupiter's Sat. III. (Ganymede).  
 30. 13h. Saturn in conjunction with moon. Saturn  $5^{\circ} 32' S$ .

NEW TABLE FOR EX-MERIDIAN OBSERVATIONS OF ALTITUDE.—In existing tables for obtaining the difference between the observed and meridian altitudes, when determining latitude by ex-meridian observations, one has to refer to two separate tables, using as arguments declination, hour angle and approximate latitude. To remedy this Mr. H. B. Goodwin, R.N., has just published a pamphlet (Griffin and Co., Portsmouth) showing how the problem may be solved by the use of one table only, which is included in his pamphlet, using approximate latitude and azimuth.

The principle on which the method is based is that a body near the meridian may be regarded as changing its altitude with a uniform rate of change, and at any one interval we may take the mean rate of change as representative, and obtain the "reduction" to meridian altitude from the formula  $dz = \sin A \cos L dh$ , where  $dz$  is the change of altitude and  $dh$  the contemporaneous change of hour